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REPORT ON FOLLOW-UP VISIT TO ECUADOR

Part II W. N. Pearson, Ph.D., ICNND Consultant
January 8-20, 1961

The status of the Institute of Nutrition of Ecuador (INNE) is far superior to its position when I made my first visit to Ecuador in the summer of 1959. Its enhanced prestige is a direct result of the ICNND Nutrition Survey which was carried out in the summer of 1959, and of the efforts of Dr. John J. Kevany who is now WHO Nutrition Consultant in Ecuador. The budget of the Institute is still far short of that needed. The original budget agreed upon when the Institute was established ran to 600,000 sucres per year (\$36,000). Actually the Institute has only received about one half of this in recent years. Dr. Kevany has recently succeeded in having it reinstated to its original level but this is no guarantee of payment. For example, no money from the government has been received by the Institute since last summer, and the operating budget last year was actually only about 300,000 sucres (\$18,000).

Through the efforts of Dr. Kevany, outside support has been obtained for certain of the research projects to be carried out by the Institute. For example, a three-year grant from the National Institutes of Health (U.S.A.) has been awarded for a study on geographic tongue. Similarly, the Williams-Waterman Fund has given funds in support of the general program for the next three years. A smaller sum has also been received from the DuPont Company to carry on a study of lysine supplementation. The library is currently being brought up-to-date by funds from the Kellogg Foundation, and it is hoped that the Ecuadorian Government will enable it to continue at its elevated level when the Kellogg grant expires. A cooperative program with the USOM agricultural group is expected to be approved shortly. Under this program, analyses of Ecuadorian feedstuffs will be carried out at the Institute of Nutrition. USOM will collect the materials for analysis, supply two technical people and furnish money each year for materials and equipment. As their contribution INNE will act in a supervisory capacity and supply working space, certain basic equipment and chemicals.

PERSONNEL

The staff of the Institute has not increased in size since 1959 in spite of the fact that its program has expanded considerably, but during this period several staff members have had additional training or experience. Last summer Dr. Recalde attended both the Fourth Armed Forces International Congress on Nutrition and the Fifth International Congress of Nutrition which were held in Denver and Washington respectively. He has, in addition, learned to read and speak English. Dr. Truncoso has had the benefit of fellowship training at INCAP. Dr. Morales is currently in Spain studying radio-isotope techniques and is scheduled to return

this summer. Dr. Martinod has recently returned to INNE after spending two years in the Department of Biochemistry at Vanderbilt University School of Medicine where he obtained an M.S. in biochemistry. During this time he attended meetings of the American Institute of Nutrition and the International Congress on Nutrition. Dr. Castillo spent several weeks at INCAP assisting in the development of food composition tables for Central and Latin American countries. Miss Pazmino is scheduled to attend the INCAP School of Dietetics within the near future, and an INCAP consultant will spend some time at the Institute rearranging the library and its cataloguing system. The Institute Director is Dr. Fabian Recalde. The staff is as follows: Biochemists - Paul Martinod, Raul Castillo, Horacio Morales; Clinician - Dr. Caesar Truncoso; Dietitians - Emma Roserio, Isabel Cabrera; Health Educator - Gloria Pazmino; Technicians - Carmen Tello, Betty de Aviles; Librarian - Gloria Paz. In addition, there are two secretaries, a custodian, a storeroom-keeper, a messenger and a chauffeur. Miss Silveria Stefanini is the FAO Consultant to the Institute of Nutrition and Dr. John J. Kevany is the WHO Consultant. Staff members arrive punctually and work a full 8-hour day. Dr. Recalde, who theoretically is required to spend only four hours each day at the Institute, now works full time. Both Doctors Castillo and Martinod are also spending full time at the Institute but, in addition, have other employment in the evening. Dr. Castillo has a private diagnostic laboratory and Dr. Martinod teaches chemistry at the Agricultural College in Quito. One senses that morale is higher than previously and that the productivity has increased.

SCIENTIFIC PROGRAMS:

A study regarding the etiology of geographic tongue is being conducted both in Quito and in Guayaquil in school children between the ages of 6 and 11 years. Fifty children with geographic tongue are being studied in each city. In both instances fifty children without geographic tongue in the same school are being studied as controls. The study consists of medical, biochemical and dietary investigations. Each child will be examined, weighed and measured every two months during the school year by Dr. Truncoso in the Sierra and by Dr. Enderica in Guayaquil. A casual urine specimen is taken each time for riboflavin, thiamine, N-methylnicotinamide and creatinine analyses. Vitamin A and Vitamin C levels are also being determined. After one school-year of observation (four examinations over an eight month period) a clinical trial will be introduced at the beginning of the next school year. Individuals having geographic tongue will be given riboflavin or placebos, and similar observations will be carried out for another year.

So far each child has been examined twice and Dr. Truncoso has recorded a high rate of spontaneous disappearance of the geographic tongue (30 percent). Both groups seem to be quite similar in regard to the urinary vitamin excretions. Also, the vitamin A and vitamin C levels were so high in both groups that it was suggested that those might be deleted in later examinations.

A strong tendency was noted to accumulate data without summarization or interpretation. Therefore, it was suggested that it should be kept up-to-date and summarized so that experimental modifications could be made if so indicated. It was also pointed out that few urinary excretion data on this age group are available and therefore the dietary histories should be carefully taken so that intake-excretion relationships might be established. These, in turn, might be useful in establishing interpretive excretion standards. Another study carried out by Dr. Castillo involved the examination of the effect of breakfast on the excretion of creatinine, thiamine and N'-methylnicotinamide. In this study the adult subjects voided upon arising in the morning, consumed their usual breakfast and collected urinary specimens at 8, 9, 10 and 11 o'clock. Again these data had been accumulated but had not been scrutinized, analyzed or interpreted. An analysis of the data revealed that the excretion of creatinine was highest at 8 o'clock and decreased with time with the exception at 11 o'clock being only half that at 8. As might be expected this caused an apparent increase in the excretion of thiamine and N'-methylnicotinamide per gram of creatinine during the same period. On the other hand, when breakfast was omitted the creatinine excretions were relatively constant from collection to collection as were the thiamine and N'-methylnicotinamide excretions. Although it was said that data had been collected on the exact composition of each breakfast they could not be found. Inquiry revealed that in most cases the breakfasts were quite simple and did not contain meat. It was recommended that the study be repeated under carefully controlled conditions to see if similar results could be obtained. In this repeat study the dietary data are to be carefully collected so that the exact intake of the nutrients involved can be estimated.

Questions regarding the Food Composition Tables of INNE from Dr. W. T. WuLeung of ICNND, who is compiling food tables for Latin American foodstuffs, were transmitted to Dr. Castillo and he will communicate directly with her. The Institute has analyzed a few new foods since publication of the 1958 tables and these results will also be made available.

Dr. Martinod is currently engaged in a study of "Chocho". This is a lupine resembling a small lima bean that grows in abundance without cultivation in the Sierra region. The bean is of extremely high protein content (around 40 percent) and has definite possibilities as a high protein, low-cost food. One of the bottlenecks encountered in attempts to increase its consumption is the fact that the bean contains alkaloids which render it extremely bitter to the taste. Extraction of the alkaloids is carried out by the Indians in the following manner: the beans are boiled for about one hour and the water drained off and are then placed in a sack and placed in a rapidly running stream of water for 7-8 days. By this means the alkaloids are washed away and the beans are rendered edible. "Chocho" is a very acceptable foodstuff and is consumed by both the lower and the middle classes in the Sierra. The feeling is that if larger quantities were available for consumption they would find a ready market. Increasing the quantities available for human consumption would appear to depend upon development of a technique whereby the alkaloids can be extracted in a rapid, efficient manner.

Another possible use for "Chocho" is as a constituent of poultry feed. The broiler industry in Ecuador is rapidly expanding but the poultry feeds consist of imported soybean concentrates to which are added local corn. It would seem reasonable to expect that the high nutritive value of "Chocho" would be equivalent to that of the soybean and that this locally-grown crop could either partially or completely replace the soybean in poultry feeding. It is also probable that the lupine might be fully accepted by the chicken without alkaloid removal but studies of this point are desirable.

It was agreed that basic need in this area would be to determine the efficiency of various extraction methods for the removal of alkaloids from the bean. It was also decided that rat acceptability tests should be carried out on the raw and cooked beans with and without removal of the alkaloids and that protein efficiency ratios should be determined against a suitable standard such as casein. To this end a small rat colony was established with breeding stock from a local pharmaceutical laboratory. A basal ration for raising the colony was developed from locally available foodstuffs: corn, wheat, skimmed milk powder, alfalfa meal, dried yeast, calcium carbonate, sodium chloride, cooked liver, and cod liver oil. The animals seemed to do well on this diet during the ten-day period observed and it is expected that no difficulty should be encountered in maintaining a small breeding colony at the Institute.

With the assistance of Dr. Combs, preliminary plans were also formulated for studies of the acceptability and nutritive value of "Chocho" as a constituent of poultry feed. A practical poultry ration based on corn and soybeans will be formulated and compared to a similar mixture based on corn and "Chocho". Since a heat treatment improves the nutritive value of soybean protein this will be also studied with "Chocho". Chicken brooders are available locally as well as broiler chicks. Once the housing equipment is purchased it is expected that the sale of the month-old chickens upon termination of the experiment will pay for both their purchase and cost of their diet. Once chemical analyses have been carried out the animal testing facilities will also contribute materially to the joint feedstuff analysis program.

A pilot study of the effects of potassium iodate on the growth and mental development of school children has been carried out with encouraging results. A larger scale study is now in the planning stages.

A Lysine fortification study is to be carried out in Riobamba in cooperation with the Andean Mission. One group of children will receive a lysine supplement with lunch and another a placebo. Heights and weights as well as hemoglobin and serum protein levels will be recorded. Difficulties with customs regarding release of a shipment of lysine have delayed initiation of this project.

Although Dr. Combs and I agreed to assist by mail with various technical aspects of the programs, there is a real need for a consultant biochemist who would remain in residence for at least a year. In lieu of this arrangement, a two-week to one-month consultant visit twice each year would contribute significantly to the Institute program.

In view of the expanded research program there is a real need for a moderate expansion of the staff of the Institute. It would seem that this could be financed by the outside research grants but the government has not yet made up its mind about this possibility. For example, a request for a full-time physician was recently denied by the Ministry even though his salary would be paid from a grant. It is difficult to see how the increased investigative commitments can be carried out optimally by the present staff even though closer supervision of technical personnel would certainly result in greater productivity.

NUTRITION EDUCATION PROGRAM

The nutrition education program of the Institute has been maintained and expanded. Under Dr. Andre, the previous WHO advisor, nutrition was made a compulsory part of the secondary education as part of the biology course. To this end a nutrition text was published privately (since the government would not authorize its publication) by Drs. Andre, Martinod, and Stefanini which is used in the teaching of this course. A similar text is in the planning stages for use in the primary schools but here again the problem of publication costs has arisen. This is one area where the USOM could be extremely helpful. A one-month course for fifty rural school-masters (teachers) was given during the summer at the Andean Mission in Riobamba. Attempts to introduce a nutrition course into the medical school curriculum have thus far been unsuccessful. A nutrition course for USOM Public Health Educators is also presented by Miss Stefanini and Miss Pazmino.

The Institute has attracted public attention by a number of devices. Its nutrition exhibit recently won first prize at a local fair. In general the production of audio-visual aids is increasing and has been given a high priority. The dietary survey department prepares monthly menus for an air force base in Quito. Since Dr. Martinod is teaching at the Agricultural College of the University and will give the first biochemistry course to be presented there, the Institute is well known in academic circles. He has also been asked to teach a nutrition course to nursing students and to offer an intensive nutrition course at the School of Public Health in Guayaquil.

SUMMARY

In consideration of the limited financial status of the Institute, considerable progress has been made since Dr. Kevany's arrival as Consultant. The education program has been expanded and new research has been initiated that has both basic and applied aspects. It is to be expected that the

outside financial assistance from U.S. private and government agencies will require (and permit) the staff to expand to meet the increased work load. In addition, outside technical assistance will be required in order that the research program be brought to full fruition.

ICNND can contribute to the latter, especially through provision of a consulting nutritional biochemist. It would also seem as if the USOM in Quito could contribute materially to the success of this program. Indeed, certain problems are likely to yield only to cooperative efforts. For example, it is the opinion of the writer that iodization of salt in Ecuador will never become a reality unless there is made a concerted effort by several agencies to keep the need before the public. It is not enough to have occasional newspaper articles on the subject - an intensive education program must be initiated by use of all mass communication media so that the public clamor so created will result in governmental action. USIA could furnish considerable technical knowledge and assistance in this area as well as assist the Institute in some of its publication problems.